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Isotope dependence of the spin gap in YBa2Cu4O8 as determined by Cu NQR relaxation

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Abstract

We performed high accuracy 63Cu NQR spin-lattice relaxation and SQUID magnetization measurements on 16O and 18O exchanged YBa2Cu4O8 to determine the isotope shift of the temperature of the opening of the spin gap, T*, and the superconducting transition temperature, Tc. The corresponding isotope exponents are αT = 0.061(8) and αT, = 0.056(12) which are the same within the error bars and suggest a common origin for the superconducting and the spin gap.